PATENT
Docket No.: 51362USA5B.010

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

GREGORY YUSCHAK ET AL.

Serial No.: 09/030,394

Filed: March 25, 1998

For: RESPIRATOR HAVING SNAP-FIT FILTER CARTRIDGE

Box AF

Group Art Unit: 3761

Examiner: Aaron J. Lewis

#20 / Appeal Brief SMT 2-16-01

APPEAL BRIEF

Board of Patent Appeals and Interferences
Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

This Appeal Brief is submitted in accordance with the terms of 35 U.S.C. § 134 and 37 C.F.R. § 1.192 in response to the final Office Action mailed June 20, 2000. Appellants furnish the Appeal Brief in triplicate. Please charge the processing fee of $310.00 (37 C.F.R. § 1.17(c)) to Deposit Account No. 13-3723.

I. Real Party In Interest

The Minnesota Mining and Manufacturing Company and the 3M Innovative Properties Company, both of St. Paul, Minnesota are the real parties in interest.

II. Related Appeals and Interferences

Appellants are unaware of any related appeals or interferences.

III. Status of Claims

Claims 1-28 are pending in the application. Claims 1-13 and 15-28 have been rejected, and claim 14 has been objected to but would be allowed if rewritten to include the limitations of the claims from which it depends.

IV. Status of Amendments

No amendments have been filed after the final rejection.

V. Summary of the Invention

Filter cartridges are commonly secured to respirators by providing threads on the filter cartridge. These threads mate with the corresponding threads on the respirator. Alternatively, bayonet-type closures have been used to attach filtering cartridges to respirators. Examples of this type of fitting are shown in U.S. Patents 5,062,421, 4,934,361, and 4,850,346. A variety of other techniques for securing filter cartridges to respirators are described in the Background section of the present application.

Although known respirators have used various techniques for securing a filter and filter cartridges to a respirator, these techniques have a number of drawbacks. For example, the filter cartridges that are threaded to the respirator typically include a housing or canister into which the filter material is retained. The cartridge's cylindrical geometry typically requires using the filter cartridge as an external appendage that can interfere with a wearer's vision, and the threaded cartridges employ many parts that add to the filter element's total volume and to the respirator's overall weight. In other designs, such as disclosed in U.S. Patents 5,078,132, 5,033,465, and 4,790,306, the filters are not able to be readily replaced, and thus when the filter element's service life has met its limit, the whole respirator is discarded as waste. In the model SR-62 respirator sold by Sundström, the filter cartridge is replaceable — however, the retainer lacks physical strength relative to the filter element, and thus, like placing a rubber tire on a wheel, a number of manipulations are needed to place the filter element in the elastomeric rubber retainer. In addition, elastomeric materials can be relatively expensive and more difficult to process.

Other respirators possess the drawback requiring gaskets or O-rings to obtain a hermetic seal, or they use fairly complicated systems for mounting filter elements to respirators.

The present invention provides a respirator that comprises a face piece, a cartridge receiving structure, and a filter cartridge. The face piece is sized to fit at least over the nose and mouth of a person. The cartridge receiving structure is located on the face piece. The filter cartridge has a housing into which a filter element is contained. The filter cartridge is capable of being snapped into engagement with the cartridge receiving structure. Engagement may be instantaneously obtainable by pressing the filter cartridge against the receiving structure without rotational movement. In some embodiments, the filter cartridge also is capable of being readily separated from the cartridge receiving structure by pulling manually on the filter cartridge.

The respirator of this invention overcomes many of the drawbacks of prior art respirators. The respirator does not require many parts to secure the filter cartridge to the respirator face piece, and there is no need for a gasket, O-ring, or permanent adhesive to obtain a hermetic fit between the cartridge and face piece. Also, the filter cartridge is relatively lightweight, and it can be mounted to and removed from the face piece in a single motion without excessive manipulation. The respirator is relatively easy to manufacture, allowing production costs to be minimized.

VI. Issues Presented

Issue 1 - Anticipation

U.S. Patent 4,945,907 to Tayebi discloses a filter element (17, 18) that is held in place by a snap-in retainer 19. The specification in the '907 patent and its prosecution history both indicate that Tayebi does not use a filter cartridge that contains a filter element. Figure 3 of the patent, however, shows a filter element 17, which when positioned on the respirator, is held in place by a retainer 19. Does the combination of the filter element 17 and the retainer 19, qualify as a "filter cartridge", which, according to Appellants' invention, has a housing into which a filter element is contained, to anticipate the present invention under 35 U.S.C. § 102?

Issue 2 - Obviousness

Appellants' invention requires a filter cartridge that includes a housing and a filter element where the filter element is contained within the housing. This filter cartridge can be snapped into engagement with a cartridge receiving structure located on the respirator's face piece. Would this

invention have been obvious to a person of ordinary skill over the Tayebi patent, which discloses that its filter element 17 and its retainer 19 are installed and removed separately from the face piece?

VII. Grouping of Claims

All the claims will stand or fall together in this appeal.

VIII. Argument

Issue 1

Appellants' invention pertains to a respirator that includes a face piece and a filter cartridge. The face piece is sized to fit at least over the nose and mouth of a person, and the filter cartridge includes a housing and a filter element that is contained in the housing. The filter cartridge is capable of being manually snapped into securement with the face piece. In one embodiment, the filter cartridge is also capable of being readily separated from the face piece, or a cartridge receiving structure located on the face piece, by manually pulling thereon. Thus, the filter element and the filter cartridge's housing can move unitarily into operative position on the face piece and can be unitarily removed from the operative position.

In other embodiments, the invention includes a snap-fit engagement mechanism that has a male member and a female member, wherein, during the engagement, either the male member initially compresses radially inward, or the male member remains essentially static while the female member initially expands radially outward.

Although the foregoing structure and functions are found in the invention, they are not found in the Tayebi patent.

Tayebi discloses a filter element 17 that is held in place by a snap-in retainer 19. Retainer 19 is molded of a flexible thermoplastic material that can bend as it is inserted into the interior of the mask shell 11 and is held in a groove therein as shown in Figure 4a. Tayebi indicates that the outer edges 20 of retainer 19 snap into the groove around the interior of the mask shell to retain the filter 17.

The merits of the anticipation rejection turn on the Examiner's contention that Tayebi's retainer 19, 20 comprises a "filter cartridge" that is "capable of being manually snapped into

engagement with the cartridge receiving structure (22)". Appellants assert that the position this unsound in that retainer 19, 20, at the time prior to being snapped into position on member 2 is totally devoid of any filter element and consequently cannot possibly constitute a "filter cartridge that has a housing into which a filter element is contained" as recited in claim 1 and similarly in all of the other claims. Appellants assert that the Examiner is not properly evaluating the reference within the legal confines given by the reviewing courts. The Examiner contends, however, that it is the Appellants who have made an "inaccurate allegation" regarding the Tayebi disclosure. In particular, the Examiner takes the position that

> Tayebi (fig. 3) illustrates [a] cartridge receiving structure (19) which "contains" a filter (17), that is, the circumference of filter (17), that is, the circumference of filter (17) is illustrated as being positioned within the confines of walls of the cartridge receiving structure (19), therefore, cartridge receiving structure (19) of Tayebi is disclosed as containing a filter 17).[1]

As the Board is aware, it is axiomatic that "each prior art reference must be evaluated as an entirety...."[2] It is not proper to evaluate a drawing without reference to the specification for all it teaches.[3]

A complete examination of Tayebi reveals that if Figure 3 is to be interpreted consistently with the remainder of the patent, the Examiner's interpretation of Tayebi cannot properly be maintained. The description of the relationship between filter 17 and retainer 19 may be found at column 10, lines 25-34:

> Filter 17 may be permanently fastened inside of mask shell 11 over holes 12 by thermobonding or by adhesives for a disposable mask, or filter 17 may be detachably fastened inside of mask shell 11 over holes 12 by a snap-in retainer 19 as shown to create a reusable mask. Further details of retainer 19 are shown in FIG. 4, and further details of how retainer 19 holds replaceable filter 17 inside of mask shell 11 by being held in a molded recess around the inner wall of the shell 11 are shown in FIG. 4a.

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[1] Although the Examiner states that the filter element is contained within a "cartridge receiving structure", it is apparent that the Examiner intended to say "housing instead.

[2] *Panduit Corp. v. Dennison Manufacturing Co.*, 774 F.2d 1082, 227 USPQ 334, 337 (Fed. Cir. 1985), *vacated and remanded, Dennison Mfg. Co. v. Panduit Corp.*, 475 U.S. 809, 229 USPQ 478 (1986), *on remand*, 810 F.2d 1561, 1566, 1 USPQ2d 1593, 1595 (Fed. Cir.), *cert. denied*, 481 U.S. 1052 (1987). *See also Ultradent Prod., Inc. v. Life-Like Cosmetics, Inc.*, 127 F.3d 1065, 44 USPQ2d 1336 (Fed. Cir. 1997) (holding that district court erred in its anticipation analysis by construing the scope of the prior art patent's disclosure as limited to the preferred embodiment).

[3] *In re Meng*, 181 USPQ 95, 97 (CCPA 1974) ("[R]eferences must be evaluated by ascertaining the facts fairly disclosed therein as a whole.").

The specification thus indicates that the filter 17 is positioned in a molded recess around the inner wall of the shell 11, and not in a housing of a filter cartridge. Tayebi's filter element 17 does not move with the retainer 19, either prior to insertion of the retainer or during removal of the retainer from the outer shell 11. In the paragraph bridging columns 10 and 11, Tayebi shows that its filtering system does not have the capability of snapping the housing and filter element onto the mask *together as a filter cartridge*:

> When it is desired to replace filter 17, retainer 19 is grasped near one edge and pulled, removing the retainer from the inside of mask shell 11. The spent filter 17 is then removed and replaced with a new filter 17 and retainer 19 is then reinstalled.

Not only does the specification provide guidance on what Tayebi shows in FIG. 3, but the prosecution history also sheds light on this subject.

U.S. Patent 4,856,508 is the first in a family of four patents issued to Tayebi, the other three (Patents Nos. 4,945,907; 5,080,094; and 5,094,236) being divisionals of the application that matured into the '508 patent. The application that matured into Tayebi '508 was the subject of a six-way requirement for election of species, the six identified species being: (1) Figures 1, 3, 4, and 4a; (2) Figure 2; (3) Figure 5; (4) Figure 7; (5) Figure 8; and (6) Figure 9. Species (5) was elected for prosecution in the application that matured into Tayebi '508. The application that matured into Tayebi '094 was directed to species (1). The prosecution history of the '094 patent thus provides some insight into what Tayebi really discloses as to the structure of the embodiment of Figures 3, 4, and 4a, the distinction between a "retainer" and a "cartridge," and whether element 19 "contains" the filter 17 (the prosecution histories of the '907 and '236 patents focused on other features of Tayebi's invention, and thus does not address the "cartridge" structure recited in the claims of the '508 and '094 patents).

Throughout these prosecution histories, Tayebi's attorney consistently distinguished between a stand-alone filter and a filter that is held inside a separate housing or cartridge.[4] For

[4] The Tayebi patents and their prosecution histories use the terms "filter cartridge" and "cartridge filter." However, a reference cannot anticipate the invention as recited in the rejected claims simply by possessing identically named parts, unless these parts also have the same structure or otherwise satisfy the claim limitations, and were understood to function in the same way by one skilled in the art. See *Applied Medical Resources v. United States Surgical Corp.*, 147 F.3d 1374, 47 USPQ2d 1289, 1293 (Fed. Cir. 1998).

example, on page 3 of the Response to the June 23, 1989 Office Action (date-stamped August 9, 1989), Tayebi's counsel argued that its filter element was not mounted in a housing:

> In the present invention the filter 17 is not mounted in a plastic housing....
>
> For a second example as seen in Figure 3 the filter material 17 may be retained against interior surface of the mask shell 11 by a thin, flat retainer 19 which permits the filter material 17 to be replaced. To replace the filter material the retainer 19 is held by force fit in a shallow-recess in the mask shell over the filter material (p. 20, l. 1-7). Further much of the retainer and the recess in which it is held are shown in Figures 4 and 4a, and are described in detail in the specification (p. 20, l. 1 to p. 21, l. 23).

On pages 3-4 of the Response to the November 22, 1990 Final Office Action (date-stamped December 23, 1990), Tayebi's counsel argued its filter element of FIG. 3 is merely retained in place (emphasis added):

> In contrast, the Applicant teaches and claims a filter element or liner that is placed directly against the mask shell and is retained in contact with same by a retainer as may be seen in Applicant's Figures 3 through 5. The retainers are easily removable to change the filter elements/liners. This is mentioned in the specification at page 21, lines 18 - 20....
>
> The Brevik patent does teach the use of a "plastic foam; such as polyethylene and polypropylene having open celluar [*sic*, cellular] structures.."... **The filter vessel [of Brevik] is still a cartridge vessel which is a container that contains the filter layers**, but the filters are never in contact with the mask shell. In addition, the filters are not replaceable.
>
> **This is not what the Applicant teaches and claims. The Applicant's filter layers are not contained in any vessel or container, but rather are placed directly against the mask shell and are retained there**....
>
> In contrast [to U.S. patent No. 4,592,350 to Maryyanek], **the Applicant teaches and claims a filter that is never inside a separate filter housing or cartridge** but, rather, is placed directly against the mask shell and is held there by a retainer. The filters are replaceable. With the Applicant's invention there is no holder or other container to encompass the filter elements.

On page 10 of the Response to the April 11, 1990 Final Office Action (date-stamped June 27, 1990), Tayebi's counsel made further comments (emphasis added):

> [The structure taught by Maryyanek] is entirely different than what is taught and claimed by the **Applicant** who **does not use a holder to support the filter on both sides and to space the filter from the mask shell**.

Similar or identical representations are made elsewhere in the '094 prosecution history and in the '508 prosecution history, in connection with the embodiments shown in Figures 2-4. Copies of the relevant pages are attached to this Brief in the Appendix, with the relevant passages highlighted in color.

In view of the above disclosures, it is clear that the filter element 17 of Tayebi is manually positioned on outer shell 11 and when replacement 13 is required, is manually removed after retainer 19, 20 has been removed from outer shell 11 as is discussed in col. 10, line 66 through col. 11, line 2 of Tayebi.

Thus, filter element 17 and retainer 19, 20 do not exist as a separate structure that can be "manually snapped into engagement with the cartridge receiving structure" as recited in claim 1. Additionally, claim 1 further distinguishes over Tayebi in reciting that "the filter cartridge is capable of being readily separated from the cartridge receiving structure by pulling manually thereon." In actuality, the filter element 17 does not ever move with the snap-retainer 19, 20 either prior to insertion of the retainer or during removal of the retainer 19, 20 from outer shell 11. The foregoing fact is made manifestly clear in the previously noted language bridging columns 10 and 11 of Tayebi.

Thus, the filter 17 is already in position on prior to the insertion of retainer 19 into mask shell 11 of Tayebi. Further, the filter remains in position on mask shell 11 when the retainer 19 is removed from the mask shell 11. Following removal of retainer 19, the spent filter element 17 is removed and replaced with a new filter. Retainer 19 is not reinstalled until after the new filter 17 has been positioned in shell 11. The Tayebi structure and operation clearly establishes that elements 19, 20 do not constitute a filter cartridge that includes a filter element as recited in claim 1 and its dependent claims. For these reasons, applicants respectfully submit that the rejection of independent claim 1 and its dependent claims 2 through 13 and 15 through 20 is improper and should be withdrawn.

The comments made above relating to claim 1 are equally applicable to independent claim 21, which distinguishes over Tayebi in reciting a filter cartridge that includes a housing and a filter element where the filter element is contained in a housing and where a snap-fitting engagement mechanism enables the filter cartridge (which includes the filter element) to be instantaneously and audibly secured to the face piece. Here again, claim 21, like claim 1, recites a filter cartridge that

includes a filter element that is contained within a housing of the filter cartridge for snap-fitting to a face piece. As noted above, Tayebi does not disclose a filter cartridge that includes a filter element and therefore cannot anticipate claim 21 under the terms of 35 U.S.C. § 102.

Independent claim 22 similarly recites a filter cartridge comprising a housing and filter element where the filter element is contained within the housing and where the housing includes means for allowing the filter cartridge to be manually and audibly snapped in engagement with a cartridge receiving structure. The comments made above regarding claim 1 are equally applicable to claim 22. Because Tayebi does not disclose a filter cartridge that includes a filter element, it cannot anticipate the invention of claim 22.

Independent claim 23 also recites a face piece and a filter cartridge that includes a housing and a filter element contained within the housing and a snap-fitting engagement mechanism for enabling the filter cartridge to be instantaneously and audibly secured to the face piece so as to distinguish over Tayebi in the same manner as claim 1 as discussed above. Since claim 23 clearly recites the foregoing structure and function not found in Tayebi, the rejection of claim 23 also should be withdrawn. The present amendment also adds the further limitation that the filter cartridge can be readily separated from the face piece so as to further distinguish over the prior art.

Independent claim 24 provides a respirator that comprises a filter cartridge that includes a housing and a filter element along with a snap-fitting engagement mechanism so as to clearly define over the teachings of Tayebi for the reasons set forth above with respect to claim 1. Therefore, the rejection of claim 24 is also improper.

Independent claim 25 distinguishes over Tayebi for the same reasons as claim 1 because it too recites a filter cartridge that includes a housing and a filter element that is contained in the housing, along with a means for manually snapping the filter cartridge into instantaneous engagement with cartridge receiving structure. Thus, Tayebi also does not anticipate claim 25 or the claims that depend from it.

In summary, the language of all of these rejected claims requires that the filter be a part of filter cartridge assembly that is snapped into position on a supporting means. Tayebi fails to disclose this feature of the present invention. Tayebi also fails to disclose a filter cartridge that is

capable of being readily separated from the cartridge receiving structure by manually pulling thereon. Tayebi therefore does not anticipate the present invention under 35 U.S.C. § 102.

Issue 2

The Examiner takes the position that Tayebi's retainer 19 fulfills the requirements of the "filter cartridge" limitation of the present invention and therefore would have made appellants' invention obvious to a person of ordinary skill. The Examiner asserts that this position is correct because Tayebi's filter 17 is contained within the retainer 19 as shown in Tayebi's Figure 3. Thus, the Examiner is evaluating Tayebi from the perspective of a "snap-shot", which is taken while the retainer is present on the mask shell 11. Applicants' claim, however, does not reflect such an approach for evaluating the filter cartridge limitation.

As set forth in applicants' claim and the accompanying specification, the filter cartridge has a (i) housing into which the (ii) filter element is contained and together these two elements (i) and (ii) are capable of being manually snapped onto a cartridge receiving structure as a unitary body; not two separate parts. Both the language in applicants' claims and the supporting specification make this clear. Although Tayebi's receiving structure 19 may allegedly "contain" a filter 17 while the retainer 19 is secured to the face mask, the retainer 19 and the filter element 17 are not manually snapped into engagement with a cartridge receiving structure as a filter cartridge.

Because the filter 17 and the retainer 19 are not capable of being snapped into engagement with the mask shell and cannot be removed from the mask shell 11 together as a filter cartridge, Tayebi would not have rendered obvious the subject matter claimed in the present invention. The Examiner has erred in interpreting the scope and content of the Tayebi patent by merely relying on Figure 3 and not examining the whole disclosure of the patent.[5] The attempt to view Figure 3 in a vacuum without reference to the specification or the public record of the prosecution history described above is clear legal error.

Because the Examiner has not reviewed Tayebi for all that it teaches and because Tayebi fails to teach or suggest a filter cartridge that has a housing into which a filter element is

[5] *In re Wesslau*, 353 F.2d 238, 147 USPQ 391 (CCPA 1965) ("[I]t is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.").

contained, Tayebi does not teach or suggest the claimed invention to a person of ordinary skill under the terms of 35 U.S.C. § 103.

IX. Conclusion

For the foregoing reasons, appellants respectfully submit that the Examiner has erred in rejecting this application under 35 U.S.C. §§ 102,103. Please reverse the Examiner on all counts.

Dated this 2nd day of February, 2001.

Respectfully submitted,

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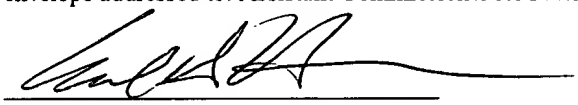

Dated: February 2, 2001

Karl G. Hanson

APPENDIX

1. A respirator that comprises:

(a) a face piece sized to fit at least over the nose and mouth of a person;

(b) a cartridge receiving structure located on the face piece; and

(c) a filter cartridge that has a housing into which a filter element is contained, the filter cartridge capable of being manually snapped into engagement with the cartridge receiving structure to produce an audible noise, the engagement being instantaneously obtainable by pressing the filter cartridge against the receiving structure without rotational movement, the filter cartridge further being capable of being readily separated from the cartridge receiving structure by pulling manually thereon.

2. The respirator of claim 1 being a negative pressure respirator.

3. The respirator of claim 1, wherein there is an interference fit between the filter cartridge and the cartridge receiving structure such that an essentially air-tight seal is provided.

4. The respirator of claim 1, wherein the filter cartridge has a flange that has a radially outward projecting surface, and the face piece has a skirt that has a radially inward projecting surface, the radially outward and radially inward projecting surfaces forming an essentially air-tight seal between the cartridge and the face piece during engagement.

5. The respirator of claim 1, including a snap-fit engagement mechanism that comprises a male member and a female member, wherein during engagement of the filter cartridge to the cartridge receiving structure, the female member first expands and then compresses radially inward.

6. The respirator of claim 1, including a snap-fit engagement mechanism that comprises a male member and a female member, wherein during engagement of the filter cartridge to the cartridge receiving structure, the male member first compresses while the female member simultaneously first expands and then the male member expands radially outward while the female member simultaneously compresses radially inward.

7. The respirator of claim 1, wherein the filter cartridge includes a cylindrical housing that contains a cylindrical filter element, the cylindrical filter element being offset axially from the

cartridge receiving structure when the filter cartridge is in engagement with the cartridge receiving structure.

8. The respirator of claim 7, wherein the cartridge receiving structure encompasses an aperture having a circumference that is substantially less than the circumference of the cylindrical filter element.

9. The respirator of claim 1, wherein the filter cartridge can be snapped into engagement with the face piece by the steps that consist essentially of pressing the filter cartridge against the face piece in a direction normal to the face piece.

10. The respirator of claim 9, wherein the filter cartridge can be removed from the face piece by the steps consisting essentially of grasping the filter cartridge and pulling thereon axially in a direction normal to the face piece.

11. The respirator of claim 1, wherein the filter cartridge mates with the cartridge receiving structure such that a force of 10 to 60 Newtons is required to remove the filter cartridge from the cartridge receiving structure.

12. The respirator of claim 11, wherein 10 to 15 Newtons of force is required to remove the filter cartridge from the cartridge receiving structure.

13. The respirator of claim 1, including a snap-fit engagement mechanism that comprises a male member and a female member, wherein during engagement of the filter cartridge to the cartridge receiving structure the male member first compresses and then expands radially outward.

14. The respirator of claim 13, further including a second engagement mechanism that is located laterally from the snap-fit engagement mechanism.

15. The respirator of claim 13, wherein the snap fit engagement mechanism is offset laterally from the filter element and includes an outflow aperture having a circumference substantially smaller than a circumference of the filter element.

16. The respirator of claim 1, wherein the cartridge receiving structure is in the form of a projecting flange, and wherein the filter cartridge includes a skirt that engages the projecting flange.

17. The respirator of claim 16, wherein the skirt is made from a polymeric resin that has a flexural modulus of $2'10^8$ to $30'10^8$ pascals, and wherein the projecting flange is made from a more rigid polymeric material that has a flexural modulus of $6'10^8$ pascals to $70'10^8$ pascals.

18. The respirator of claim 16, wherein the projecting flange has a radially outward projecting surface that engages a radially inward projecting surface on the skirt.

19. The respirator of claim 18, wherein the skirt expands radially outward from a rest condition and the projecting flange is pressed radially inward when the filter cartridge is pressed towards the face piece.

20. The respirator of claim 19, wherein the skirt exerts pressure on the projecting flange during engagement to create an essentially airtight seal between the skirt and the flange.

21. A respirator that comprises:

a face piece sized to fit at least over the nose and mouth of a person;

a filter cartridge that includes a housing and a filter element, the filter element being contained within the housing; and

a snap-fit engagement mechanism that enables the filter cartridge to be instantaneously and audibly secured to the face piece, the snap-fit engagement mechanism including a male member and a female member, wherein during the snap-fit engagement of the filter cartridge to the face piece the male member initially compresses radially inward while the female member simultaneously initially expands radially outward followed by the male member expanding radially outward while the female member simultaneously compresses radially inward.

22. A filter cartridge useful for filtering contaminants that are inhaled through a respirator worn by a person and for permitting instantaneous attachment and removal from a cartridge receiving structure on a face piece of the respirator, the filter cartridge comprising a housing and a filter element, the filter element residing in the housing and the housing including a means for allowing the filter cartridge to be manually and audibly snapped into engagement with a cartridge receiving structure by pressing the filter cartridge against a cartridge receiving structure on a face piece without using rotation movement and for readily separating the filter cartridge from the cartridge receiving structure by pulling manually thereon.

23. A respirator that comprises:

a face piece sized to fit at least over the nose and mouth of a person;

a filter cartridge that includes a housing and a filter element, the filter element being contained within the housing; and

a snap-fit engagement mechanism that enables the filter cartridge to be instantaneously and audibly secured to the face piece, the snap-fit engagement mechanism including a male member and a female member, wherein during the snap-fit engagement of the filter cartridge to the face piece, the male member initially compresses radially inward while the female member remains essentially static followed by the male member expanding radially outward.

24. A respirator that comprises:

a face piece sized to fit at least over the nose and mouth of a person;

a filter cartridge that includes a housing and a filter element, the filter element being contained within the housing; and

a snap-fit engagement mechanism that enables the filter cartridge to be instantaneously and audibly secured to the face piece, the snap-fit engagement mechanism including a male member and a female member, wherein during the snap-fit engagement of the filter cartridge to the face piece, the male member remains essentially static while the female member initially expands radially outward followed by compressing radially inward.

25. A respirator that comprises:

(a) a face piece sized to fit at least over the nose and mouth of a person;

(b) a cartridge receiving structure located on the face piece;

(b) a cartridge receiving structure located on the face piece;

(c) a filter cartridge including a housing and a filter element contained in the housing; and

(d) means for manually snapping the filter cartridge into instantaneous engagement with the cartridge receiving structure to produce an audible noise by pressing the filter cartridge against the receiving structure without rotational movement and for readily separating the filter cartridge from the cartridge structure by pulling manually thereon.

26. The respirator of claim 25, wherein the means for manually snapping includes a male member and a female member so configured wherein during the snap-fit engagement of the filter cartridge to the face piece the male member initially compresses radially inward while the female member simultaneously initially expands radially outward followed by the male member expanding radially outward while the female member simultaneously compresses radially inward.

27. The respirator of claim 25, wherein the means for manually snapping includes a male member and a female member so configured wherein during the snap-fit engagement of the filter

cartridge to face piece, the male member initially compresses radially inward while the female member remains essentially static followed by the male member expanding radially outward.

28. The respirator of claim 25, wherein the means for manually snapping includes a male member and a female member so configured wherein during the snap-fit engagement of the filter cartridge to the face piece, the male member remains essentially static while the female member initially expands radially outward followed by compressing radially inward.

The Examiner, referring to Applicant's claim 2, points to retainer 16 in the Maryyanek patent and, referring to claim 8, points to filter liners 15, 17, 19 in the Maryyanek patent. The Applicant respectfully disagrees with the Examiner. Retainer 16 in the Maryyanek reference is only the outer part of a two piece plastic housing / filter holder which is used to hold a separate filter. The plastic housing pieces 22 are permanently attached to the mask shell and in which the filters 15, 17, 19 are placed and retained by plastic retainers 16. The filters never touch the mask shell but rather are captivated in the two parts of the filter housing. This is not much different than holding a filter cartridge in a holder. This is entirely different than what is taught and claimed by the Applicant who does not use a holder to support the filter on both sides and to space the filter from the mask shell.

In the present invention the filter 17 is not mounted in a plastic housing. Rather, for a first example of a disposable mask, as may be seen in Figure 2 a piece of filter material 18 is fastened against the exterior of mask shell 11, instead of in a separate filter housing, by adhesive or thermal bonding (p. 19, l. 21). The filter liner may also be attached against the interior surface of the mask shell in the same manner (p. 19, l. 33 to p. 20, l. 1).

For a second example as seen in Figure 3 the filter material 17 may be retained against interior surface of the mask shell 11 by a thin, flat retainer 19 which permits the filter material 17 to be replaced. To replace the filter material the retainer 19 the filter material (p. 20, l. 2) shallow recess. Further details of the retainer and the recess in which it is held are shown in Figures 4 and 4a, and are described in detail in the specification (p. 20, l. 1 to p. 21, l. 23).

For a third example, when replaceable filter liners 17 and 18 are attached against both the inside and outside of the foam mask shell 11, a slightly different retainer is used that is shown in Figure 5 and is described in detail in the specification at p. 21, l. 27 to p. 23, l. 12. Rather than having recesses on the outside and inside surfaces of the mask shell 11 for the two retainers 24 and 26 to hold the two filter liners 17 and 18, outer retainer 24 has protrusions 28 that pass through mask shell 11 and detachably snap connect to inner retainer 26 at holes 27.

These approaches described in the previous three paragraphs are not suggested or taught in any of the art cited by the Examiner, either singly or collectively. It is respectfully

reused and there is nothing in this patent that even suggests this. There are a plurality of filter layers inside the vessel. These filter layers are contained inside "vessel" 11 and never contact the mask shell 1, although "vessel" is attached to mask shell 1 through opening part 2 at the front of mask shell 1. It is never even suggested that the filter layers directly contact the mask shell.

In contrast, the Applicant teaches and claims a filter element or liner that is placed directly against the mask shell and is retained in contact with same by a retainer as may be seen in Applicant's Figures 3 through 5. The retainers are easily removable to change the filter elements/liners. This is mentioned in the specification at page 21, lines 18 - 20. As may be seen in Figure 5 a first filter element/liner 18 is placed directly against the outer surface of mask shell 11, and a second filter element/liner 17 is placed directly against the inner surface of mask shell 11. Filters 17 and 18 are held in direct, intimate contact with mask shell 11 by a retainer made up of elements 24 and 26.

The Brevik patent does teach the use of a "plastic foam; such as polyethylene and polypropylene having open celluar structures..". However, the Brevik reference does not teach or suggest the use of a replaceable filter cartridge so it is respectfully contended that it would not be obvious to combine Yo and Brevik that way. Nor does the Brevik reference suggest or teach that filter elements be in direct contact with the mask shell. If just the use of foam taught in Brevik is used in the Yo patent, you have the Yo mask with a foam mask shell instead of the "soft, flexible respirator body, which is formed froma synthetic resin" (col. 2. l. 10 in the Yo reference). The filter vessel is still a cartridge vessel which is a container that contains the filter layers, but the filters are never in contact with the mask shell. In addition, the filters are not replaceable.

This is not what the Applicant teaches and claims. The Applicant's filter layers are not contained in any vessel or container, but rather are placed directly against the mask shell and are retained there. In addition, in the Applicant's invention the filter elements are replaceable as mentioned in the last paragraph. Further, with the Applicant's invention a filter liner is located inside of the mask shell. Neither Yo or Brevik suggest or teach a replaceable filter, or a filter that is located inside of the mask shell.

In view of these primary, distinctive differences the Applicant contends that his invention is not obvious over the Yo reference in view of the Brevik reference.

The Examiner next states that "Claims 5 and 6 are rejected under 35 USC 103 as being unpatentable over Yo in view of Brevik as applied to claims 1-4 and 7-9 above, and further in view of Maryyanek et al. The patent to Maryyanek et al. shows a mask having a filter section 22, 74, 14 fastened to the exterior of a mask shell 12. In view of this teaching of Maryyanek et al., it would have been obvious to provide a filter liner fastened to the exterior of a mask shell. Note that whether a filter liner is fastened to the exterior of a mask shell or to the interior of a mask shell is not a critical factor of the claimed invention and provides no obvious result. The provision of more than one filter liner is well-known in the art."

The Applicant respectfully disagrees with the Examiner. The Maryyanek patent discloses a basic respirator of a type well known in the prior art. There is a shell 18 molded of a material such as rubber (col.3,l.4) as is well known in the art. There is a "facepiece 12" and "filter holders or housings 22" (col.2,l.65-68). These basic elements are well known in the prior art. Maryyanek claims rigid, triangular shaped filter housings 22, triangular filter covers 16, with inhalation valves 24 that pass the filtered air. The filter housing comprised of elements 16, 22 is fastened through the wall of mask shell 18. Filter elements 14 are held inside of the filter housing but are never in contact with the mask shell 18. Filter elements 14 may be replaced. In addition, filters 14 are always located external to the mask shell of the Maryyanek respirator.

If the Maryyanek patent is combined with the Yo and Brevik references, the most that can be obtained is a foam mask shell with a rigid filter housing attached through the wall of the mask shell, and filters are mounted inside the housing. The filters are always external to the mask shell, and are never in contact with the mask shell.

In contrast, the Applicant teaches and claims a filter that is never inside of a separate filter housing but, rather, is placed directly against the mask shell and is held there by a retainer. The filters are replaceable. With the Applicant's invention there is no holder or other container to hold filter elements.

Thus, there are significant differences between the Applicant's invention and the patents cited by the Examiner. The Applicant has further amended claims 1, 2, 5 and 6 to make these differences clearer.

For example, amended claim 1 now reads in part: "said filter liner being placed directly against and in contact with said mask shell without the need for a container to hold the filter liner". The other claims are similarly amended.

The Examiner has rejected claims 1 - 9 under the judicially created doctrine of obviousness type double patenting as being unpatentable over claims 1 - 7 of United States Patent No. 4,856,508. The Examiner states that "Although the conflicting claims are not identical, they are not patentably distinct from each other because even though applicant uses different wordings in the claims. Claims 1 - 9 describe the structure recited in claims 1 - 7 of the U.S. Patent No. 4,856,508."

The Applicant respectfully disagrees with the Examiner citing the '508 patent for the following reasons. First, and most important, the '508 patent cited by the Examiner is the parent application of the present patent application. This is not permitted. Therefore, the filing date of the '508 patent is the same as the present patent application and does not predate the present patent application. The present patent application was divided out of the '508 reference in response to a requirement for election made by the Examiner prosecuting the '508 reference. Accordingly, the invention of the present application is shown in the drawing and is described in the specification of the '508 patent.

Second, the one independent claim, claim 1, in the '508 patent claims a face mask having a mask shell made of closed cell foam that has shape retention, and a filter cartridge mounted to cover holes through the central portion of the shell. This is not the invention claimed in the present patent application. In the '508 patent the invention is shown in Figure 8 and there is a collar 38 fastened in a hole 37 through the central portion of the foam mask shell. A replaceable cartridge 40 is friction fit inside the opening through collar 38. A discrete filter cartridge is shown in a number of the references cited by the Examiner but is not part of the present invention.

With the embodiment claimed in the '508 reference the filter element inside the cartridge is never in contact with the foam of the mask shell and, because of collar 38, the plastic housing of the cartridge is never in contact with the foam of the mask shell either. This distinction is an important part of the present invention that is now clearly claimed in the amended claims as of the answer to the previous Office action. For example, amended claim 1 claims:

> "a first filter liner for filtering the air passing through said holes, said filter liner being placed directly against and in contact with said mask shell without the need for a container to hold the filter liner, and being held against said mask shell and

Applicant respectfully contends that although the Yo reference teaches the same types of elements, elements that are found in all filter masks, they are combined differently than in the Applicant's invention. In addition, the Applicant respectfully contends that combining the Yo reference with the Brevik and Ennan et al references does not make the Applicant's invention obvious. The reasons are given below.

First, the Yo reference teaches a respirator that has a separate "filter vessel 11" (col. 2, l. 38, 51, 58) that contains the filter elements. It is a conventional filter cartridge. This "filter vessel" is cylindrical and has intake holes (l. 39) on the outer surface of the filter vessel, and a inhalation port 12 at the inner end of the filter vessel (l. 41). These holes are necessary to permit air to pass through the filter vessel (cartridge) and through the filters inside thereof. The filters 15 -18 are mounted inside the "filter vessel" (col. 2, l. 51 - 57).

The mask shell ("respirator body 1") of the Yo reference has an opening part 2 (col. 2, l. 11) through the front of the shell in which the "filter vessel" is "detachably fitted" (col. 2, l. 39, 40). As may be seen in Figure 2 of the Yo reference, its "respirator body 1" has a lip (not numbered) which results in it necessarily being fitted to the respirator body from the front, and the filter vessel and the filters therein do not extend to the interior of the mask. Since the filter layers are contained inside "vessel 11" they can never directly contact the respirator body 1. It is not even suggested in the Yo reference that the filters 15 - 18 directly contact the respirator body.

In contrast, the Applicant teaches and distinctly claims a filter element or liner that is placed against the mask shell and is retained in direct contact with the mask shell as may be seen in Applicant's Figures 2 through 5. No filter vessel or cartridge of any kind to contain the filters is needed. In Figure 2 the filter may be adhesively attached permanently directly against the outside of the mask shell, or directly against the inside of the mask shell (p. 19, l. 33 et seq). Alternatively, the filter elements may be replaceable and a retainer is used to hold the filters directly against and in contact with the mask shell. The retainers are easily removable to change the filter elements. This is mentioned in the Applicant's specification at page 21, lines 18 - 20. This also may be seen in Figures 3 through 5. As may be seen in Figure 5 a first filter element/liner 18 is placed against and in direct contact with the outer surface of mask shell 11, and a second filter element 17 is placed against and in direct contact with

the inner surface of mask shell 11. Filters 17 and 18 are held in direct, intimate contact with mask shell 11 by a retainer made up of elements 24 and 26. This is distinctly different than taught by Yo.

The patent to Brevik shows a face mask for filtering air made of foam material, but the foam is "open celluar" (col. 3, l. 5-8) and is intended that it filters the breathed air that passes through it. The Applicant's mask shell is made of closed cell foam and cannot possibly function with an open cell foam shell. Breathed air would pass through the open cell foam mask shell and not through the filter. If poisonous fumes are in the air being breathed they would pass through an open cell foam mask shell and be breathed, to the detriment of the wearer of the mask.

The Examiner states that the newly cited Ennan et al reference "shows a mask shell with filter liner 13 placed directly against the shell".

The newly cited UK patent to Ennan et al teaches internal and external filters laid directly over a frame mask shell which is made of polyethylene (p.2, l.22) and having large holes 2 therethrough. The external filter is made of "fibrous electrostatically charged material made up of ultrathin polymeric fibers". This external filter is not attached to a separate plastic mounting piece such as Applicant's piece 33, but rather lays over the outside of the mask shell and its edge 8 is held in a groove around the periphery 9 of the mask shell by a rubber cord 10 (p.2, l.27-35). The internal filter 13 has a "fibrous base" (p.2, l.123) with chemisorption material (p.2, l.119-124) and is secured to "the internal surface of the mask 1 so that an edge 15 of the second layer (internal) fits to the edge 8 of the first layer of filtering material folded over the edge 9 (Figure 1) of the mask on a section 16 (Figure 2) (p.2, l.39-46). The edge of the second layer "fits to edge of the first layer of the filtering material folded over the mask edge" (p.1, l.49,50). Thus, the inner and outer filters of the Ennan reference are both held by the same rubber cord 10. In addition, the filter material will be in contact with the face of the wearer of the mask as shown in Figures 1 and 2. To change one filter of the Ennan mask requires removing the rubber cord and detaching both filters since the edge of the inner filter fits to the edge of the outer filter.

In contrast, the internal and external filters 17 and 18 of the Applicant's face mask lie directly against the mask shell 11 as shown in Figures 2 through 5 and are held in direct contact therewith by a snap-in retainer 19 as shown in Figures 3 and 4, by adhesive as shown in Figure 2, and by filter retainer 23 as shown in Figure 5. The filters, mounted in direct contact with

for any other means such as the "inward folding ridge 32" of the Maryyanek reference and its "outer ridge 34" which is necessary to give "a material stiffness which maintains the respirator's shape" (col. 3, l. 21-23 in Maryyanek).

The Examiner, referring to Applicant's claim 2, points to retainer 16 in the Maryyanek patent and, referring to claim 8, points to filter liners 15, 17, 19 in the Maryyanek patent. The Applicant respectfully disagrees with the Examiner. Retainer 16 in the Maryyanek reference is only the outer part of a two piece plastic housing / filter holder which is used to hold a separate filter. The plastic housing pieces 22 are permanently attached to the mask shell and in which the filters 15, 17, 19 are placed and retained by plastic retainers 16. The filters never touch the mask shell but rather are captivated in the two parts of the filter housing. This is not much different than holding a filter cartridge in a holder as taught by Yo. This is entirely different than what is taught and claimed by the Applicant who does not use a holder to support the filter on both sides and to space the filter from the mask shell.

In the present invention the filter 17 is not mounted in a plastic housing. Rather, for a first example of a disposable mask, as may be seen in Figure 2 a piece of filter material 18 is fastened directly against the exterior of mask shell 11, instead of in a separate filter housing, by adhesive or thermal bonding (p. 19, l. 21). The filter liner may also be attached directly against the interior surface of the mask shell in the same manner (p. 19, l. 33 to p. 20, l. 1).

For a second example as seen in Figure 3 the filter material 17 may be retained directly against interior surface of the mask shell 11 by a thin, flat retainer 19 which permits the filter material 17 to be replaced. To replace the filter material the retainer 19 is held by force fit in a shallow recess in the mask shell over the filter material (p. 20, l. 1 - 7). Further details of the retainer and the recess in which it is held are shown in Figures 4 and 4a, and are described in detail in the specification (p. 20, l. 1 to p. 21, l. 23).

For a third example, when replaceable filter liners 17 and 18 are attached against both the inside and outside of the foam mask shell 11, a slightly different retainer is used that is shown in Figure 5 and is described in detail in the specification at p. 21, l. 27 to p. 23, l. 12. Rather than having recesses on the outside and inside surfaces of the mask shell 11 for the two retainers 24 and 26 to hold the two filter liners 17 and 18, outer retainer 24 has protrusions 28 that pass through mask shell 11 and detachably snap connect to inner retainer 26 at holes 27.

If the Maryyanek patent is combined with the Yo and Brevik references, the most that can be obtained is a foam mask shell with a rigid filter housing attached through the wall of the mask shell, and filters are mounted inside the housing. The filters are always external to the mask shell, and are never directly in contact with the mask shell as taught and claimed by the Applicant.

In contrast, the Applicant teaches and claims a filter that is never inside a separate filter housing or cartridge but, rather, is placed directly against the mask shell and is held there by a retainer. The filters are replaceable. With the Applicant's invention there is no holder or other container to encompass the filter elements.

Thus, there are significant differences between the Applicant's invention and the patents cited by the Examiner. The Applicant has further amended claims 1, 2, 5 and 6 to make these differences much clearer.

For example, amended claim 1 now reads in part: "said filter liner being placed directly against and in contact with said mask shell without the need for a container to hold the filter liner". The other claims are similarly amended.

In view of the amendments to the claims and the arguments given by the Applicant above, the amended claims are believed to be allowable and passage to issuance is respectfully requested. In the alternate, the claims are placed in better condition for appeal.

If there remain any matters that may be resolved by telephone to place the application in condition for allowance the Examiner is invited to call the undersigned attorney to expeditiously resolve such matters.

Sincerely,

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